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International Specialists in the Environmental Sciences

July 9, 1982

Mr. R. D. Stonebraker, Deputy Chief
Hazardous Emergency Response Branch
Air and Hazardous Materials Division
Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, GA 30365

Dear Mr. Stonebraker:

EARTH RESISTIVITY SURVEYS OF
LEES LANE LANDFILL
LOUISVILLE, KENTUCKY
TDD No. F4-8206-01

Region IV FIT personnel conducted earth resistivity surveys of Lees Lane Landfill in Louisville, Kentucky during the week of June 21-25, 1982. Two resistivity field crews of three members each comprised the FIT. The landfill is approximately 125 acres in size and was covered in most part by high grass and undergrowth and typical landfill debris. Some adjustments to the planned 200-foot grid pattern were made because of the landfill size, undergrowth, and debris. Resistivity profiles were conducted at 124 locations with three different electrical "A" spacings. These "A" spacings or distances between each electrode were chosen to investigate the subsurface at depths of 45, 60, and 80 feet below the ground surface. Over most of the landfill these depths are just below the water table (45 feet), in the middle zone of the Alluvial aquifer (60 feet), and at the contact of the Alluvial aquifer and weathered bedrock (80 feet). Along the Ohio River shoreline and near the ponds in the southern section of the landfill the ground surface elevations were approximately 45 feet lower than ground surface elevations in the center of the landfill. Compensation for these elevation changes were made to allow for proper correlation and interpretation of the profile data.

The resistivity profile data is presented in Figure 1. The resistivity values varied from highs of greater than 1,000 ohm-feet along the levee to lows of less than 20 ohm-feet inside the landfill. A value of 300 ohm-feet was chosen to represent the extent of interpreted ground-water contamination. The interpreted extent of contamination correlates well with the location of ferromagnetic metals on the site. Also, there is

good correlation between the interpreted extent of contamination and the general location of waste areas as seen on the 1963 aerial photograph of the site. Due to the grid spacing used and the physical constraints on the site, a detailed delineation of the ground-water contamination was not possible.

During the field investigation ground-water seepage from the river bank was observed at several locations along the Ohio River shoreline. The Ohio River was at a low stage of 386.9 feet during the investigation, and based upon Corps of Engineer records, the river should be low until October. The ground-water seepage proves that ground-water flow is toward the Ohio River during low river stages. Sampling of the seepage and associated sediment should be conducted while the river is low. This data would indicate if contamination is flowing directly into the Ohio River. It is recommended that this sampling be conducted. To confirm the resistivity profile data and to provide useable wells, new ground-water monitoring wells are recommended. A minimum of ten wells would be necessary to adequately monitor the ground water (see Figure 1). These wells should be drilled to solid bedrock and screened opposite permeable zones. Individual screened zones could be sampled by using a double-packer assembly. These wells should be four inches in diameter to allow for submersible pumps.

Sincerely,

H. Dan Harman, Jr.

H. Dan Harman, Jr., P.G.
Project Officer

James L. Templeton Jr.

James L. Templeton, Jr.
Field Investigation Team Leader
Region IV

HDH/JLT/lsr

Attachments: Figure 1 (folded)

cc: Barry Burus, KYDNREP
TDD No. F4-8206-01 Project Files
TDD No. F4-8206-01 NPMO Office Files